an orthogonal transforming processor that applies an orthogonal transformation to image data arranged in a first matrix comprised of a plurality of pixels to obtain orthogonal transformation coefficients of image data arranged in said first matrix; and

an expanded image generating processor that applies an inverse orthogonal transformation to said orthogonal transformation coefficients to obtain expanded image data arranged in a second matrix comprised of a greater number of pixels than said first matrix.

Please amend claim 13, as follows:

13 (Twice Amended). The pixel number increasing apparatus according to claim 12, wherein said first and second matrixes are comprised of 8 x 8 and 64 x 64 pixels, respectively, and said expanded image generating processor obtains expanded image data by said two dimensional inverse discrete cosine transformation expressed by the following formula:

$$I'^{(s,t)}_{yx}=\frac{1}{4}\sum_{u=0}^{7}\sum_{v=0}^{7} CuCvD^{(s,t)}_{vu}\cdot COS\frac{(2x+1)uII}{128}COS\frac{(2y+1)vII}{128}$$

wherein, $0\leq x\leq 63$, $0\leq y\leq 63$, I'_{yx} is the pixel value of expanded image data, Cu, $Cv=1/2^{1/2}$ when u, v=0, Cu, Cv=1 when u, v≠0, and D_{vu} is a DCT coefficient obtained by said two dimensional discrete cosine transformation.

Please amend claim 14, as follows:

14 (Amended). A pixel number increasing apparatus, comprising an expanded image generating processor that applies an inverse orthogonal transformation to image data arranged in a first matrix comprised of a plurality of orthogonal transformation coefficients to obtain expanded image data arranged in a second matrix comprised of a greater number of pixels than said first matrix.

Please amend claim 16, as follows:

16 (Twice Amended). The pixel number increasing apparatus according to claim 15, wherein said first and second matrixes are comprised of 8 x 8 and 64 x 64 pixels, respectively, and said expanded image generating processor obtains expanded image data by said two dimensional inverse discrete cosine transformation expressed by the following formula:

$$I'^{(s,t)}_{yx}=\frac{1}{4}\sum_{u=0}^{7}\sum_{u=0}^{7} CuCvD^{(s,t)}_{vu}\cdot\cos\frac{(2x+1)uII}{128}\cos\frac{(2y+1)vII}{128}$$

wherein, $0\le x\le 63$, $0\le y\le 63$, I'_{yx} is the pixel value of expanded image data, Cu, $Cv=1/2^{1/2}$ when u, v=0, Cu, Cv=1 when u, v≠0, and D_{vu} is a DCT coefficient obtained by said two dimensional discrete cosine transformation.

REMARKS